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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/447,030 11/22/99 FORBERT R AE97/151US

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EXAMINER

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ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 03/28/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	07/447,030	Applicant(s)	FORBERT et al
Examiner	N. M. NGUYEN	Group Art Unit	1754

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication .
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- Responsive to communication(s) filed on 2/22 & 2/26/01.
- This action is FINAL.
- Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- Claim(s) 13 - 24 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- Claim(s) _____ is/are allowed.
- Claim(s) 13 - 24 is/are rejected.
- Claim(s) _____ is/are objected to.
- Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The proposed drawing correction, filed on _____ is approved disapproved.
- The drawing(s) filed on _____ is/are objected to by the Examiner.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- All Some* None of the CERTIFIED copies of the priority documents have been received.
- received in Application No. (Series Code/Serial Number) _____.
- received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

Attachment(s)

- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____ Interview Summary, PTO-413
- Notice of Reference(s) Cited, PTO-892 Notice of Informal Patent Application, PTO-152
- Notice of Draftsperson's Patent Drawing Review, PTO-948 Other _____

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DETAILED ACTION

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim 23 provides for the use of lyogels, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 23 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 13, it is unclear what is required by "perceptibly". As defined by the American Heritage Dictionary, Second College Edition, "perceptibly" is "capable of being perceived", thus, it is unclear if the limitation of "perceptibly dissolves in the lyosol" requires that the vapor atmosphere has to dissolve in the lyosol or only appears to dissolve in the lyosol (but actually not dissolve).

If the phrase "does not perceptibly dissolve" has relative meaning, just as "soluble" (i.e. slightly soluble, very soluble, etc.), such phrase would render the claim indefinite. The phrase "does not perceptibly dissolve" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. On page 4, second full paragraph, it is stated that air does not dissolve in the hydrosol, however, the instant specification, including the Example 1, does not clearly exemplify which vapor atmosphere does or does not perceptibly dissolve in the hydrosol.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13-14, 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Bergna et al (4,131,542) with the Grant and Hackh's Chemical Dictionary and Chemical Engineer's Handbook to show inherent state of fact.

Bergna '542 discloses a process for making amorphous spheroidal silica grains which comprises the steps of:

- (a) spray drying with flowing air at a temperature from 130 to 400°C a silica sol;
- (b) sintering the porous micrograins to reduce the surface area thereof from 5% to 20%
(note claim 1).

Bergna '542 further discloses that the feed in most cases is a silica aquasol (note column 5, lines 46-47). Bergna '542 also discloses that the manner in which spray contacts the drying air is an important factor in spray dryer design, as this has great bearing on dried product properties by influencing droplet behavior during drying. The spray can be directed into the hot air entering from the top of the drying chamber. Product and air pass through the drying in "co-current" flow, so called after the inlet-outlet layout for air, feed, and dried product (note column 7, lines 56-60). Alternatively, the spray can be contacted with air in "counter-current" flow. Spray and air enter at the opposite ends of the dryer. This arrangement offers dryer performance with excellent heat utilization (note column 8, lines 3-6). Fast heating of the droplets produces a dry skin of silica trapping water inside the hollow spheres (note column 8, lines 8-10). This silica is considered as a

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hydrogel (as Grant and Hackh's Chemical Dictionary defines "gel" as colloidal solution of a liquid in a solid).

When spray and air are contacted in counter current flow, either the spray or the air must be flowing against gravity. Thus, the claimed "moving medium flows substantially against the direction of the force of gravity" can be "at once envisaged" from the disclosure of Bergna '542. When the flow of air is fed from the bottom of the dryer, it goes against the direction of gravity and naturally its speed would diminish in the direction of flow.

From the Chemical Engineers' Handbook, for "countercurrent" spray dryer, hot air is introduced from the bottom and feed is sprayed from the top (note Figure 20-71(a)).

The process of Bergna '542 anticipates the claimed process.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was

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made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 13-14, 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergna '542, with Grant and Hackh's Chemical Dictionary and optionally in view of Chemical Engineers' Handbook.

Bergna '542 discloses a process as stated above.

Chemical Engineers' Handbook can be applied to teach for countercurrent spray dryer, the hot air is conventionally introduced from the bottom.

The difference is Bergna '542 does not disclose how the lyosol is formed.

However, the method for making the starting material is given little weight absence a showing of criticality, as the starting material made by any process would be expected to perform the same function in the process. Moreover, the examiner takes Official Notice that it is known in the art to form silica sol by reacting sodium silicate with a mineral acid and using the product of one process as starting material for another process would have been within the skill of the skilled artisan, In re Kamlet 88 USPQ 106.

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Claims 13-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marisic (2,384,946) in view of Fernholz et al (3,939,199) and optionally further in view of Mielke et al (5,656,195).

Marisic '946 discloses a process of producing hydrogel pellets by continuously contacting within an enclosed mixing chamber such as an injector or nozzle mixer, streams of reactant solutions of such concentration and proportions that no gelation occurs within the mixer, but only at some predetermined time after leaving the mixer, and under such conditions of flow that each stream is completely and uniformly dispersed within and throughout the other at the instant of contact. The resultant colloidal solution is ejected from the mixer through an orifice or orifices of suitable size so as to form globules of the solution which are introduced into a fluid medium where the globules of the colloidal solution set to a gel before they pass out of the medium (note page 2, lines 48-64). The fluid medium can be constituted of a gas such as air (note sentence bridging the 2 columns on page 2).

Marisic '946 further disclose that the medium may contain components which can be dissolved therefrom by the hydrosol (note page 1, left column, lines 17-18).

Marisic '946 discloses that the hydrogel can be produced from a solution of sodium silicate and hydrochloric acid (note Example III).

It would have been obvious to one skilled in the art to select any embodiment among the specifically disclosed embodiments, Merck & Co. Inc. v. Biocraft Laboratory Inc. 10 USPQ 1846.

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Marisic '946 discloses that the apparatus can be adapted for upward flow of the colloidal solution during gelation (note page 3, right column, lines 67-70). Marisic '946 further discloses that the fluid medium is maintained at a temperature below the boiling point of said sol. After setting is complete, the hydrogen may be washed, base exchanged, heat treated or otherwise processed to obtain the desired physical and chemical characteristics in the final product (note page 2, right column, lines 14-40).

Marisic does not specifically disclose the temperature of the process, however, it would have been obvious to optimize these process conditions to obtain the best results. It would also have been obvious to dry the hydrogel to obtain aerogel since aerogel is desired in the art. For the step of converting the hydrogel to aerogel, in the event that the above heat treating step of Marisic '946 is not sufficient to convert the hydrogel to aerogel, Mielke '195 can be applied as stated below.

Mielke '195 teaches that silica aerogel particles are desired to be used in moldings (note claim 1). Mielke '195 further discloses that silica aerogel can be produced by solvent exchange, and subsequent supercritical drying a silica hydrogel.

Thus, it would have been obvious to one of ordinary skill in the art to convert the hydrogel of Marisic to aerogel because aerogel is desired to be used in moldings as suggested by Mielke '195.

The difference is Marisic 946 does not disclose that the fluid is moving substantially against the direction of gravity.

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Fernholz '199 discloses that for a spray-drying process for converting a sol to a gel, in order to avoid damage of the gelled and still soft particles, they can be sprayed in upward inclined direction and collected in a liquid bath (for example water) or they can be conducted in countercurrent flow with a current of air or gas which reduces their impact velocity and simultaneously improves their resistance by drying. In this manner particles of almost any desired size can be produced (note column 2, lines 23-33).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use a current or air or gas in countercurrent flow with the spray of silica sol in the process of Marisic '946, as suggested by Fernholz '199 because such countercurrent flow of air would reduce the silica gels impact velocity and improve their resistance by drying.

For claim 20, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have used both the water bath and the countercurrent flow of air to avoid damage of the gelled and still soft particles, because combining two or more ways as disclosed in Fernholz '199 for the same purpose has been held to be a prima facie case of obviousness, see *In re Kerkhoven*, 205 USPQ 1069.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Because of the undue large number of references submitted in the IDS (filed 8/23/00), Applicants are requested to point out any especially critical or relevant portion for the prior art, especially for the foreign patents without an English translation.

Any inquiry concerning this communication should be directed to Ngoc-Yen Nguyen at telephone number (703) 308-2536.

The fax phone number for this Group is (703) 305-3599 (for OFFICIAL After Final amendment only) or (703) 305-5408 (for all other OFFICIAL faxes). UNOFFICIAL fax can be sent to (703) 305-6078.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

N. M. Nguyen
March 26, 2001

Ngoc-yen Nguyen
N. M. Nguyen
Primary Examiner
Art Unit 1754